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ESSAY

EVOLUTIONARY THEORY AND THE ORIGIN OF PROPERTY RIGHTS

James E. Krier†

For legal scholars, the evolution of property rights has been a topic in search of a theory. My aim here is to draw together various accounts (some of them largely neglected in the legal literature), from dated to modern, and suggest a way they can be melded into a plausible explanation of property's genesis and early development. What results hardly amounts to a theory, but it does suggest an outline for one. Moreover, it provides a primer on the subject, a reasonably solid foundation for thinking and talking about the evolution of property rights.

I

Harold Demsetz's *Toward a Theory of Property Rights*,¹ despite its many well-known shortcomings, has been the "point of departure for virtually all efforts to explain changes in property rights" since its publication some forty years ago.² I make it my point of departure as well.

Demsetz is an economist. The thesis put forth in his article is "that the emergence of new property rights takes place in response to . . . new benefit-cost possibilities" as resource values change;³ in other words, property rights develop in a society when the benefits of having

† Earl Warren DeLano Professor, University of Michigan Law School. I am grateful to Greg York, Ph.D. (Biology), M.I.T. 1998, J.D., University of Michigan 2008, for exemplary research assistance and constructive criticism, especially on matters of evolutionary biology. Thanks also to the following for discussions, correspondence, references, and comments on various draft manuscripts: John Alcock, Greg Alexander, Michael Barr, Ben Barros, Al Brophy, Shahar Dillbary, Bob Ellickson, Lee Anne Fennell, Owen Jones, Kevin Kerber, Frances Lewis, Carol Rose, Chris Serkin, Henry Smith, and participants in the Gruter Institute Squaw Valley Conference, May 2007, the University of Colorado Property Works in Progress Workshop, June 2007, and law school workshops at the University of Alabama and Cornell University. The University of Michigan Law Library provided its usual extraordinary assistance with source materials.

¹ Harold Demsetz, *Toward a Theory of Property Rights*, 57 AM. ECON. REV. PAPERS & PROC. 347 (1967).

² Thomas W. Merrill, *Introduction: The Demsetz Thesis and the Evolution of Property Rights*, 31 J. LEGAL STUD. S331, S331 (2002); see also *id.* at S333, where Merrill lists the shortcomings of Demsetz's article. We will get to them shortly.

³ Demsetz, *supra* note 1, at 350.

them exceed the costs of getting them.⁴ As an example, Demsetz cited anthropological studies of Native American tribes inhabiting Canada's Labrador Peninsula.⁵ Initially, the tribes treated hunting land as a commons open to all tribal members, who used it for various purposes, including hunting beaver for furs. For a time, the Indians' modest needs naturally limited the rate of hunting, but matters changed when a commercial fur trade with European settlers developed in the early 1700s. The demand for furs, the rewards from hunting, and thus the rate of hunting, increased. The run on beaver posed a threat of scarcity. In response, the tribes developed a system of private hunting territories that were allocated to individual families who had the right to retaliate against trespassers.⁶

It is apparent in his article that Demsetz supposed these measures were a sufficient response to the problem of overhunting. (He was wrong.)⁷ His reasoning will sound familiar, as indeed it was. He based his analysis on the economics of common ownership, the details of which were well understood at least a half-century before Demsetz wrote.⁸ When a resource is held in common, any commoner who ex-

⁴ See, e.g., *id.* at 350 (asserting that property rights develop when the gains thus achieved become larger than the costs thus entailed); *id.* at 353 (discussing "the value and cost of establishing" property rights). While Demsetz argued that costs and benefits affected the development of property rights, he believed that community preferences also had an impact, especially as to the "form" of the rights. *Id.* at 350, 354. He pictured three "idealized forms of ownership"—communal, private, and state. *Id.* at 354. He took the first to be ownership by all members of a community and the last to mean ownership by a governing authority, such as the state, a village, and so forth. As to private ownership, he usually took it to mean ownership by a single individual, in severalty.

⁵ See Demsetz, *supra* note 1, at 351 n.3 (citing Eleanor Leacock, *The Montagnais "Hunting Territory" and the Fur Trade*, AM. ANTHROPOLOGIST, Oct. 1954, at 1). As Demsetz noted, Leacock was in essence building upon, and to some extent disagreeing with, an earlier work, Frank G. Speck, *Basis of American Indian Ownership of the Land*, OLD PENN WKLY. REV., Jan. 16, 1915, at 491.

⁶ Demsetz, *supra* note 1, at 351–53. Regarding trespass, Demsetz misread the evidence. Leacock's memoir emphasized that trespass meant one thing only, namely an intrusion arising "when hunting for meat or fur to sell. . . . [A] man finding himself in need of food on another's land may kill the beaver—even all the beavers in a lodge—although he cannot kill them to sell the fur." Leacock, *supra* note 5, at 2 (footnote omitted). Notice the perverse incentive that resulted from this narrow prohibition on trespass: tribe members could use their own hunting territories to hunt beaver for sale and use their neighbors' hunting territories to hunt beaver for private consumption.

⁷ See THRAINN EGGERTSSON, ECONOMIC BEHAVIOR AND INSTITUTIONS 251–52 (1990) (discussing John C. McManus, *An Economic Analysis of Indian Behavior in the North American Fur Trade*, 32 J. ECON. HIST. 36 (1972)). McManus learned from historians of the fur trade "that beaver populations were sharply reduced after the introduction of the fur trade into an area," McManus, *supra*, at 39, and that the Hudson Bay Company, the only buyer of furs for a time, had to take its own measures to conserve the beaver population, *id.* at 46. He attributed the overhunting of beaver, in part, to the narrow prohibition on trespass discussed *supra* note 6, which, in his view, had been adopted to provide a form of social insurance against threats of starvation. *Id.* at 51.

⁸ See Henry E. Smith, *Exclusion Versus Governance: Two Strategies for Delineating Property Rights*, 31 J. LEGAL STUD. S453, S457 n.9 (2002) (noting that the "problem of overuse char-

exploits the resource gains all the benefits of doing so for himself, whereas the costs spill over onto everybody. In contrast, individual rights, where each member of the community is entitled to a separate resource packet, to the exclusion of other members, concentrates costs and benefits and thus creates constructive incentives. Anyone who decides to use his packet in a given way reaps the benefits but also bears the costs, which are equal to the value of opportunities forgone by exploitation as opposed to conservation.

What Demsetz added to this understanding was a fuller appreciation of the economies realized by individual ownership.⁹ Notice that even with individual shares—for example, separate parcels of land—it is still unlikely that *all* the costs of any owner's uses will thereby be felt exclusively by him. Suppose there is a community of n individuals, each owning his own parcel of land. A might use his property in a way that affects the property of some neighbors, say by building a dam that causes a stream on his land to flood the lands of B and C but not the land of anyone else. A does not feel the brunt of the flooding directly, as he would were the dam to end up submerging his own parcel, but A can be made to feel it through a process of negotiations whereby B and C offer him inducements to stop using his land in a way that floods theirs. Demsetz's distinctive contribution was to demonstrate how individual holdings reduce the transaction costs of the negotiation process by reducing the number of people who have to negotiate. If the land were held in common, then all n commoners would have to deal with each other, whereas with individual holdings, the negotiations are confined to A , B , and C .¹⁰ Such bargaining would bring home to A the costs that his activities impose on others, transforming

acteristic of a commons was first systematically studied" in 1911, citing literature). But one can go back much further, to Aristotle and Aquinas, for instance, both of whom understood that common ownership promotes not just overuse of the resource in question but also underproduction. See, e.g., ARISTOTLE, *POLITICS*, bk. 2, pt. 5, at 1262–64 (Trevor J. Saunders trans., Oxford Univ. Press 1995) (c. 350 B.C.); 2 THOMAS AQUINAS, *SUMMA THEOLOGICA*, IIa, IIae, Q. 66, art. 2 (Fathers of the English Dominican Province trans., 2d & rev. ed. 1920) (c. 1265–74).

⁹ Demsetz's argument built on R. H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960), which demonstrated that in the absence of transaction costs, all spillover effects of an activity will be taken into account through negotiations among the affected parties.

¹⁰ Hume seems to have anticipated Demsetz's point by several centuries. See DAVID HUME, *A TREATISE OF HUMAN NATURE*, bk. 3, pt. 2, § 7, at 538 (L.A. Selby-Bigge ed., Oxford Univ. Press 2d ed. 1978) (1740):

Two neighbours may agree to drain a meadow, which they possess in common; because 'tis easy for them to know each others mind; and each must perceive, that the immediate consequence of his failing in his part, is, the abandoning the whole project. But 'tis very difficult, and indeed impossible, that a thousand persons shou'd agree in any such action; it being difficult for them to concert so complicated a design, and still more difficult for them to execute it; while each seeks a pretext to free himself of the trouble and expence, and wou'd lay the whole burden on others.

the costs to them into an opportunity cost to him that he would compare to the benefits he stood to realize were he to continue in his ways.¹¹

In contrast to his careful explanation of the manner in which individual property rights reduce transaction costs, Demsetz said little about the process by which the rights might originate. He supposed that they result from "gradual changes in social mores and in common law precedents," themselves to some degree the product of "legal and moral experiments"—"hit-and-miss procedures" that select in favor of cost-minimizing approaches, at least in societies that place a premium on efficiency.¹²

II

Here is a summary of Demsetz's account and its problems:

Demsetz was explicit about the cost-benefit criterion for change in property rights, offered a sophisticated account of the benefits of property, and included one compelling illustration of his thesis. But the article said nothing about the factors that determine the costs of a property regime. It said virtually nothing about the precise mechanism by which a society determines that the benefits of property exceed the costs, other than to disclaim any position on whether this would necessarily entail a "conscious endeavor." And it said virtually nothing about the form that emergent property rights are likely to take, other than to observe that whether a society adopts private property or state-owned property may turn in part on the "community's tastes" for collectivism.¹³

¹¹ I note in passing the oddness of Demsetz citing the development of Indian hunting territories as a relevant example of his argument. Those hunting territories were held by families, not single individuals, and family ownership could give rise to high transaction costs even if the owners were few in number, thanks especially to opportunistic behavior (freeriders, holdouts) that provokes costly haggling, as in bilateral monopoly situations. This is why modern property law grants tenants in common and joint tenants the unilateral right to partition their holdings and convert them into ownership in severalty. In this connection, a close reading of the anthropological evidence cited by Demsetz suggests that the family territories were eventually partitioned off to individual family members—perhaps for the reasons just suggested. See Leacock, *supra* note 5, at 1 (noting that there was "continual readjustment of band lands to fit the needs of band members. Each Indian has a right to trapping lands *of his own* . . ." (emphasis added) (footnote omitted)). That the hunting territories were, prior to partition, a commons, though one limited to family members (which could be few or many), might be another reason the beaver stock was overhunted, as discussed *supra* note 7.

¹² Demsetz, *supra* note 1, at 350. In a later article, Demsetz asserted that "a right-defining and conflict-resolving institution, such as the court system, the legislature, or some community authority, is inevitably part of any property right system." Harold Demsetz, *Property Rights*, in 3 *THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW* 144, 144 (Peter Newman ed., 1998).

¹³ Merrill, *supra* note 2, at S333 (quoting Demsetz, *supra* note 1, at 350).

With all these shortcomings, Demsetz's argument would seem to contribute little to understanding the evolution of property rights. But, it now appears, Demsetz never had any such aim in mind when he wrote *Toward a Theory of Property Rights*. Recently (less than a year ago as I write this), Demsetz said that he had not claimed to view changes in property rights (or social change in general) "as an evolutionary process."¹⁴ Rather, he had sought only to suggest a positive theory that property rights develop in response to costs and benefits,¹⁵ choosing to "avoid the different, difficult problem of how property right adjustments are actually made."¹⁶

III

Even if *Toward a Theory of Property Rights* has little if any theory about the evolution of property rights, it can be used to illuminate the subject. First, though, I want to establish a clear understanding of what the subject is. The literature regularly uses "property rights," "evolution," and "evolutionary theory" as if their meanings were unambiguous and shared by all, which they are not, resulting in an unnecessary muddle. So let me specify exactly what I take the key terms to mean.

"*Property rights.*" Begin with two assertions made by Jeremy Bentham. First: "The idea of property consists in an established expectation; in the persuasion of being able to draw such or such an advantage from the thing possessed, according to the nature of the case." And second: "Now this expectation, this persuasion, can only be the work of law."¹⁷

For purposes of constructing an evolutionary account, we have to define property rights in a way that accepts Bentham's first statement but rejects his second one. The second statement has to be rejected simply because property rights, in the sense of Bentham's "established expectations," emerged thousands of years before the existence of any

¹⁴ Harold Demsetz, *Frischmann's View of "Toward a Theory of Property Rights"*, 4 REV. L. & ECON. 127, 128 (2008). I thank Brett Frischmann for calling this item to my attention.

¹⁵ *Id.*

¹⁶ *Id.* at 129. It is strange that Demsetz waited so long to set the record straight. He had a perfect opportunity to do so at a 2001 conference convened particularly to reexamine *Toward a Theory of Property Rights*. The title of the conference was "The Evolution of Property Rights." Conference papers were subsequently published in Symposium, *The Evolution of Property Rights*, 31 J. LEGAL STUD. S331 (2002). Virtually all of the papers take Demsetz's article as an evolutionary account. Demsetz himself participated in the conference and contributed a paper. See Harold Demsetz, *Toward a Theory of Property Rights II: The Competition Between Private and Collective Ownership*, 31 J. LEGAL STUD. S653 (2002). Nowhere in that paper did he comment on the misapprehensions of his work.

¹⁷ JEREMY BENTHAM, *THE THEORY OF LEGISLATION* 112 (Richard Hildreth trans., 1975) (1802); see also *id.* at 113 ("Property and law are born together, and die together. Before laws were made there was no property; take away laws, and property ceases.").

"law."¹⁸ Primitive property rights were *de facto*, not *de jure*. The feature that defined them as *de facto property* rights, as opposed to *de facto* some-other-sort-of rights, is that they concerned assets from which possessors (owners) could choose to exclude others with the expectation that those others would respect that choice. Probably there were often situations in which several co-owners shared possession; in such cases, any co-owner could exclude any nonowner, but not other co-owners. Still, though, the co-owned possession would be *private* property because of the right of the co-owners to exclude non-owners. This stands in contrast to an open-access commons (as in the state of nature, a universal commons), where all may use the resource and none may exclude others. If nobody has a right to exclude, there is no property.

Demsetz, recall, talked in terms of "communal" property, which he described as property belonging to all members of a given community.¹⁹ An ambiguity thus arises. If, as is likely, Demsetz thought that members of a given community would not aim to exclude each other in such a case but would aim to exclude members of other communities, then there would be what is called, in modern parlance, a limited-access commons (maybe not limited very much, but nevertheless limited). Demsetz made no mention of such a commons, apparently not noticing that his example of a tribal system of family allotments amounted to such. For him there was communal property belonging to all, private property belonging to a single individual, and state property belonging to the government. This is clumsy not only because it overlooks the limited-access commons, but also because it implies that private property is conterminous with individual ownership when it obviously is not. As Carol Rose has nicely put it, a limited-access commons is common on the inside, but private on the outside²⁰—the former because co-owners may not be excluded, the

¹⁸ See, e.g., SAMUEL BOWLES, MICROECONOMICS: BEHAVIOR, INSTITUTIONS, AND EVOLUTION (2004). Bowles points out that individual claims on property preceded the development of agriculture about eleven millennia ago and became more extensive thereafter; the rights "emerged and proliferated without the assistance of states or other centralized enforcement agencies." *Id.* at 382. Many thousands of years later, "centralized forms of punishment and enforcement of property rights began to emerge as a new form of organization." *Id.*

¹⁹ See discussion *supra* note 4.

²⁰ See Carol M. Rose, *The Several Futures of Property: Of Cyberspace and Folk Tales, Emission Trades and Ecosystems*, 83 MINN. L. REV. 129, 155 (1998) (referring to "commons on the inside, property on the outside"). This usage is consistent with everyday lay usage. Suppose you and I own Ouracre as tenants in common. Is it not our private property? And so too if we join with twenty more, or one hundred, or one thousand? Still, some property scholars subscribe to a view that "private property" refers only to ownership by "one person or a small number of persons." See, e.g., Thomas W. Merrill, *Property and the Right to Exclude*, 77 NEB. L. REV. 730, 733 (1998) (using that definition). I regard this as not quite correct,

latter because nonowners may be excluded. Private property is inclusive of individual property, but the converse does not hold.

None of the foregoing should be taken to suggest that property rights are limited to the feature of exclusion (hardly), but exclusion is enough to get us started.²¹ We can picture an exclusion continuum running from a single owner to a few co-owners to many co-owners of the right to exclude from some given possession. The greater the number of co-owners of a resource, the more likely the resource will suffer the mismanagement and undue exploitation characteristic of an open-access commons.

"Evolution" and *"evolutionary theory."* As any dictionary will confirm, "evolution" is a term with many meanings.²² It refers, in the most general sense, to a process of gradual change, and it goes without saying that property rights have, in this sense, evolved. Primitive rights emerged at some point, and they were followed eventually by developments that culminated in the full-blown property systems of modern times. A project that merely described the course of events would be an evolutionary study of sorts and would no doubt provide fodder for an evolutionary theory, but it would not amount to one. An evolutionary theory of property rights aims to provide a plausible explanation of their genesis and development, given whatever evidence we might happen to have.

There are at least two very different types of evolutionary accounts that might be used to explain the emergence of property rights. One type views property as the product of intentional undertakings: property is "designed." The other type sees property as an unintended consequence of individual actions: property arises "spontaneously." To account for property in the latter manner is to present an invisible-hand explanation, which "explains what looks to be the product of someone's intentional design, as not being brought about by anyone's intentions."²³ This definition does not exclude *all* intentions but only any intention to achieve the particular developments in

though I suppose it matters little so long as everybody agrees on what everybody is talking about. But, as I have already suggested, everybody does not; hence the muddle.

²¹ On the centrality of the exclusion right to the conception of property, see, for example, Merrill, *supra* note 20 *passim*.

²² See, e.g., 5 OXFORD ENGLISH DICTIONARY 476–77 (2d ed. 1989) (indicating sixteen meanings within three general significative categories).

²³ ROBERT NOZICK, ANARCHY, STATE, AND UTOPIA 19 (1974); see also BOWLES, *supra* note 18, at 57 (using the same terminology). Nozick cited a number of examples of invisible-hand explanations, most of which would be unfamiliar to legal scholars. See NOZICK, *supra*, at 20–21. An example he did not provide, but which might be familiar, is the body of literature arguing that common law rules are pushed in the direction of efficiency because inefficient rules are litigated more often than efficient ones, thus increasing the probability that the inefficient rules will be filtered out over time. For discussion and criticism, see RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 604 (7th ed. 2007).

question.²⁴ Adam Smith long ago highlighted the distinction in *The Wealth of Nations* when he spoke of a marketplace where every individual “intends only his own gain,” yet is “led by an invisible hand to promote an end which was no part of his intention.”²⁵

The most familiar evolutionary account of the invisible-hand type is Darwin’s theory of the origin of species.²⁶ (The point of view opposed to it is an intentional-design type of account, aptly named Intelligent Design.)²⁷ But evolutionary explanation is not limited to prehistoric events, much less to biological phenomena. For example, the literature on the contemporary development of property rights uses both types of evolutionary accounts.²⁸ Usually government plays some role in these accounts; however, I want to focus on the emergence of property many millennia before the state and other governmental institutions themselves emerged (thus belying Bentham’s assertion that the existence of a legal system is essential to the existence of a property system).²⁹ Because property began in prehistoric times, no one can really prove what actually happened, as a matter of historical truth. The objective is a plausible explanation that is logically intact and consistent with what we know about human development.

IV

It is a strange thing about *Toward a Theory of Property Rights*. For forty-plus years readers take it to be an evolutionary account, then its author says it is not. Critics complain that the article fails to explain

²⁴ See, e.g., Jack Hirshleifer, *Evolutionary Models in Economics and Law: Cooperation Versus Conflict Strategies*, 4 RES. L. & ECON. 1, 10 (1982) (“The inventor of the bow had an intention, but it was only to help himself or his band; the spread of a new technique of hunting . . . was surely beyond his purpose.”).

²⁵ ADAM SMITH, *THE WEALTH OF NATIONS* 423 (Edwin Cannan ed., Random House 1937) (1776); see also, e.g., Robert Sugden, *Spontaneous Order*, in *THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW*, *supra* note 12, at 485, 493 (contrasting “individual motivation and unintended collective consequence”).

²⁶ See CHARLES DARWIN, *ON THE ORIGIN OF SPECIES BY MEANS OF NATURAL SELECTION* (6th rev. ed. 1888).

²⁷ See PERCIVAL DAVIS & DEAN H. KENYON, *OF PANDAS AND PEOPLE: THE CENTRAL QUESTION OF BIOLOGICAL ORIGINS* (1989), for the first comprehensive (and controversial) account of Intelligent Design in a high-school textbook explaining the origin of new organisms.

²⁸ See, e.g., ROBERT C. ELLICKSON, *ORDER WITHOUT LAW: HOW NEIGHBORS SETTLE DISPUTES* (1991) (discussing the governance of relations among neighboring cattle ranchers by reference to informal norms and developing a theory of norm formation); Richard A. Epstein, *The Allocation of the Commons: Parking on Public Roads*, 31 J. LEGAL STUD. S515, S528–33 (2002) (discussing the spontaneous emergence of snow-parking property rights in contemporary Chicago); Katrina Miriam Wyman, *From Fur to Fish: Reconsidering the Evolution of Private Property*, 80 N.Y.U. L. REV. 117 (2005) (presenting a case study that takes account of the role of government and the political process in the development of property rights).

²⁹ See *supra* text accompanying note 17.

how property rights emerge; Demsetz says he chose to avoid that difficult matter altogether, aiming only to suggest *why* property rights emerge. The article itself is ambiguous, consistent with each point of view. I want to highlight what Demsetz *seems* to have said about the evolutionary question of *how*, because doing so lets us explore the distinction between the two types of evolutionary accounts—intentional design and unintended consequences.

Intentional design. Bits and pieces of Demsetz's argument can be reasonably taken to suggest that he was thinking about an evolutionary account based on intentional design. His thesis that property rights develop in response to changes in costs and benefits seems to refer to a process whereby some centralized agency sums up social costs and benefits, then chooses the most efficient property rights arrangement, subject to "a community's preferences for private ownership."³⁰ The process might be "hit-and-miss" to some degree and involve "legal and moral experiments,"³¹ but "inevitably" there is a purposeful and authoritative designer in the picture.³²

Unintended consequences. Other bits and pieces of Demsetz's argument point in the direction of an unintended-consequences (invisible-hand) type of account. For example, he thought that changes in property rights in response to changes in costs and benefits need not be "the result of a conscious endeavor"; instead, the process could involve "gradual changes in social mores" that occur without some particular end in mind and entail no central authority.³³ Moreover, individual practices, rather than collective choices, could be the source of changes in property rights.³⁴ Demsetz mentioned an example involving hunters, each of whom marked the territory he regularly used as his own in order to give notice of his claim—presumably with the expectation that others would respect it.³⁵ He discussed another example involving portable personal items (weapons, pottery, and other utensils) that—because they took time and effort to produce, were useful, and could be easily protected by keeping them close at hand—were recognized as private property in primitive societies, simply as a matter of social practice.³⁶

Now we can take a closer look at the two types of evolutionary accounts and see how they figure in the literature.

³⁰ Demsetz, *supra* note 1, at 350.

³¹ See *supra* text accompanying note 12.

³² See *supra* note 12 and accompanying text.

³³ Demsetz, *supra* note 1, at 350.

³⁴ See *id.* (asserting that changes in property rights result from "the desires of the interacting persons").

³⁵ *Id.* at 352.

³⁶ *Id.* at 353 n.7.

V

Begin with intentional design. As Richard Dawkins has pointed out, a central difficulty with evolutionary explanations based on design is that they invite "an inevitable regression to the problem of the origin of the designer."³⁷ So how did commoners living in a state of nature with open access to resources and no government manage, in the first instance, to set up a property system? This is a crucial question in accounts based on design. Simply asserting that commoners self-consciously cooperated in the development of property regimes does not answer it, nor does assuming that central authorities of some sort imposed property regimes.³⁸ The first assertion, self-conscious cooperation, begs the question because it is the *absence* of cooperation that was the problem to begin with, brought on, as Demsetz demonstrated, by high transaction costs. Taking it as a given that property rights, individual rights in particular, reduce transaction costs *once the rights are in place*, the fact remains that the same bothersome transaction costs must be confronted in order to *get* the rights in place by means of cooperation.³⁹ Hence just how cooperation was achieved needs to be explained. But this, of course, Demsetz did not do.

Much the same can be said of the second assertion, centralized intervention by some sort of governing authority.⁴⁰ How did the authority come into being, absent cooperation and collective action?⁴¹

Readers who take Demsetz's account as an evolutionary explanation based on intentional design criticize it on just the grounds sketched above, and give similar treatment to later works written in a Demsetzian vein. The charge is that the approach assumes away the crucial problems of collective action and of accounting for the presence of government.⁴² One proposed methodological solution to this

³⁷ RICHARD DAWKINS, *THE ANCESTOR'S TALE: A PILGRIMAGE TO THE DAWN OF EVOLUTION* 602 (2004).

³⁸ Unless, of course, the account obviously takes for granted the existence of the designer and is interested only in how things developed from there on. A study of how the Federal Communications Commission allocates spectrum would not be rightly criticized for failing to explain how the Commission came to be created, how the authority that created it came to be authorized, etc.

³⁹ See, e.g., James E. Krier, *The Tragedy of the Commons, Part Two*, 15 HARV. J.L. & PUB. POL'Y 325, 337-39 (1992).

⁴⁰ "Kicking [the problem] upstairs," to use Carol Rose's nice expression. See Carol M. Rose, *Evolution of Property Rights*, in 2 THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW, *supra* note 12, at 93, 94.

⁴¹ A governing authority might have come into power by force, but still the collective action problem persists; the challenge becomes one of explaining how any group managed to organize itself into a force.

⁴² See, e.g., Stuart Banner, *Transitions Between Property Regimes*, 31 J. LEGAL STUD. S359, S362 n.8 (2002) (collecting citations); Krier, *supra* note 39, at 338 n.44 (collecting citations); see also EGGERTSSON, *supra* note 7, at 254 (discussing the failure of various accounts to "deal with the free-riding problems that plague group decision"); *id.* at 250 (finding this

problem, developed over the last several decades, works up from the idea that small, close-knit groups have advantages in overcoming obstacles to constructive collective action. Group members are relatively few in number, known to each other, share common interests, and interact repeatedly. These features facilitate cooperation, whether in the formation of property norms by group decision or by group delegation to a central authority itself created by group decision.⁴³ It is likely by this means that individuals moved out of the state of nature and into increasingly centralized levels of organization, eventuating, after many millennia, in modern government—the ultimate designer. More on this later.

Demsetz's account in *Toward a Theory of Property Rights* has been likened to the much earlier views (seventeenth century) of Thomas Hobbes and John Locke.⁴⁴ Carol Rose, for example, has said that Demsetz took their story and "told it once again,"⁴⁵ and this is, to some degree, certainly so. Their story, much like his, began with an initial situation of open access to a common stock of natural resources, no ownership, and no civil government. Hobbes figured that any commoner taking a thing out of the stock would thereafter treat it as his own but would have to stand ready to defend his possessions against grabbing by intruders. Commoners might try to enhance the security of their holdings by making contracts among themselves, promising not to interfere with the possessions of others so long as others promised the same in return, but self-help was the only means of restraining promisors from reneging (and think of the transaction costs!). Hence, Hobbes concluded, life would be marked by ongoing battles.⁴⁶ Locke agreed. His labor theory dictated that anything taken from the commons rightly belonged to the taker, "at least where there is enough, and as good left in common for others,"⁴⁷ but he conceded

a characteristic feature of the "naive theory of property rights," which "seek[s] to explain the development of exclusive property rights without explicitly modeling social and political institutions. Demsetz's 1967 paper . . . is the classic reference for the naive theory of property rights." (emphasis omitted)); ITAI SENED, *THE POLITICAL INSTITUTION OF PRIVATE PROPERTY* 16 (1997) (observing that the flaw is typical of social contract accounts); *id.* at 34–48 (discussing examples).

⁴³ See Rose, *supra* note 40, at 95 (referring to the argument and noting some of the leading literature).

⁴⁴ See THOMAS HOBBS, *LEVIATHAN* (Michael Oakeshott ed., Oxford Univ. Press 1960) (1651); JOHN LOCKE, *TWO TREATISES OF GOVERNMENT* (Peter Laslett ed., Cambridge Univ. Press 1960) (1690).

⁴⁵ Rose, *supra* note 40, at 94.

⁴⁶ HOBBS, *supra* note 44, ch. 13, at 81–84.

⁴⁷ LOCKE, *supra* note 44, bk. 2, § 27, at 306; see also *id.* bk. 2, § 28, at 307 ("[T]is the taking any part of what is common, and removing it out of the state Nature leaves it in, which *begins the Property* . . ."). Locke's view is reflected in the rule of capture familiar to modern property law, according to which wild animals in their natural condition belong to the first person to kill them, capture them in hand, trap them, or mortally wound them. See, e.g., *Pierson v. Post*, 3 Cai. 175, 179 (N.Y. Sup. Ct. 1805). The dissent in *Pierson* argued

that commoners might regularly disregard this principle, with a "*State of War*" being the likely consequence.⁴⁸ Hobbes and Locke both thought that the only solution was some sort of governing authority arising by mutual agreement among all (the fanciful "social contract").⁴⁹

Although Demsetz's account is similar in a few respects to the views of Hobbes and Locke, it has one important difference that can easily go unnoticed. Hobbes and Locke pictured a world of ongoing battles over possessions, absent the invention and intervention of government. In contrast, in parts of his article, Demsetz seemed to envision a norm of respect for possession that emerged on its own and went forth without enforcement. Several instances were mentioned earlier,⁵⁰ and another lurks in the logic of Demsetz's argument. Implicit in his discussion is the assumption that any commoner who took from the standing resource stock thereby acquired an individual right to the thing taken, with everybody acting accordingly. Individuals regarded resources as common while in place, but as private once severed.⁵¹ Why might people have behaved like that?

VI

Consider an invisible-hand answer to the question, one with its own distinguished forbear. In *A Treatise of Human Nature*, David Hume introduced the idea of behavioral "conventions"⁵² that arise spontaneously from "a general sense of common interest; which sense all the members of the society express to one another, and which induces them to regulate their conduct by certain rules. . . . [T]he actions of each of us have a reference to those of the other, and are perform'd upon the supposition, that something is to be perform'd

for an alternative rule whereby ownership would vest in the first person to pursue with a reasonable prospect of capture, *id.* at 182, and Locke might well have agreed. See LOCKE, *supra* note 44, bk. 2, § 30, at 308 ("[T]he Hare that any one is Hunting, is thought his who pursues her during the Chase. For being a Beast that is still looked upon as common, . . . whoever has imploy'd so much *labour* about any of that kind, as to find and pursue her, has thereby removed her from the state of Nature, wherein she was common, and hath *begun a Property*.").

⁴⁸ LOCKE, *supra* note 44, bk. 2, § 17, at 297.

⁴⁹ HOBBS, *supra* note 44, ch. 15, at 94 (need for a governing authority), ch. 18, at 109–13 (governing authority established by mutual agreement), ch. 18, at 112 (power of governing authority to make and enforce rules); LOCKE, *supra* note 44, §§ 18–20, at 297–300 (need for a governing authority), § 211, at 424 (governing authority established by mutual agreement), § 222, at 430 (power of governing authority to make "Rules set as Guards and Fences to the Properties of all the Members of the Society").

⁵⁰ See *supra* text accompanying notes 35–36.

⁵¹ Demsetz had to assume such a practice or his argument would have lost its anchor. If sharing persisted after severance, incentives to overwork the common stock—a central premise in the logic of Demsetz's account—would be much reduced, replaced by the problem of shirking in the maintenance of the common resources.

⁵² HUME, *supra* note 10, bk. 3, pt. 2, § 2, at 490.

on the other part.”⁵³ Today we speak of a convention as a social practice generally adhered to by the members of a particular social group without any explicit agreement or external enforcement, thanks to a general expectation that the practice will be followed. This expectation is one of the reasons any individual follows the practice, such that the practice is taken by all to reflect a shared understanding or implicit agreement.⁵⁴ Hume’s view, thus understood, anticipated much later developments in modern game theory,⁵⁵ in which conventions are “mutual best response outcomes that are sustained by the fact that virtually all players believe that virtually all other players will best respond.”⁵⁶

With respect to property rights and rights of individual ownership in particular, Hume saw them as the remedy to problems of exploitation. Without property rights, whatever anyone gathered, grew, or built would be vulnerable “to the violence of others,”⁵⁷ but all the while it would be in the interest of each person “to leave another in the possession of his goods, *provided* he will act in the same manner with regard to me.”⁵⁸ So there might develop “a convention enter’d into by all the members of the society to bestow stability on the possession of . . . external goods, and leave every one in the peaceable enjoyment of what he may acquire by his fortune and industry.”⁵⁹ The convention, Hume said, “arises gradually, and acquires force by a slow progression, and by our repeated experience of the inconveniences of transgressing it.”⁶⁰

Hume thought that animals (humans aside) “are incapable of . . . property.”⁶¹ Biologists say otherwise. They observe that members of many species—various spiders, insects, birds, and mammals, for example—commonly resolve territorial disputes by a simple rule: the resi-

⁵³ *Id.*

⁵⁴ See Robert Sugden, *Conventions*, in 1 THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW, *supra* note 12, at 453, 454.

⁵⁵ See SENED, *supra* note 42, at 19 (“Hume’s logical analysis preceded by two centuries similar contemporary game theoretic arguments . . .”). Sened probably had in mind evolutionary game theory in particular. Evolutionary game theory is an instance of non-cooperative game theory; it focuses on the formation of norms and conventions, meaning patterns of behavior that emerge spontaneously and are self-enforcing. For a quick overview, see George J. Mailath, *Evolutionary Game Theory*, in 2 THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW, *supra* note 12, at 84, 84. As applied to humans, the approach “stresses rule-of-thumb behaviors that are updated by a backward-looking learning process, that is, in light of one’s own or others’ recent experience.” BOWLES, *supra* note 18, at 33. It assumes that individuals are boundedly rational but not quite so cognitively gifted as the people who populate classical game theory.

⁵⁶ BOWLES, *supra* note 18, at 43.

⁵⁷ HUME, *supra* note 10, bk. 3, pt. 2, § 2, at 487–88.

⁵⁸ *Id.* at 490.

⁵⁹ *Id.* at 489.

⁶⁰ *Id.* at 490.

⁶¹ *Id.* bk. 2, pt. 1, § 12, at 326.

dent always wins.⁶² The rule, deference to possession, is a product of biological evolution, and the core explanation of why and how it developed is usually credited to the biologist John Maynard Smith, who summarized and extended his views in *Evolution and the Theory of Games*.⁶³ Here, in simplified form, is his explanation:

Picture a situation in which two conspecifics (members of the same species) are drawn to a particular breeding territory with a value v equal to the *gain* in reproductive fitness realized by the animal that ends up with that territory rather than with a less favorable alternative. Either animal might, with equal probability, arrive first and be a possessor or second and be an intruder. And either animal will be either an aggressive type called Hawk or a passive type called Dove. Hawks fight until one is injured and retreats to less favorable territory, and in any Hawk-Hawk contest the animals have equal chances of winning or being injured. (Injury carries a cost c measured in terms of reduced reproductive fitness.) As to Doves, they may engage in preliminary bluffing but never engage in fights; hence, they avoid injury but end up losing territory to Hawks and sharing it with Doves.⁶⁴ On these assumptions, and remembering that in any contest between two Hawks each has a fifty percent chance of injury, the payoffs (for the row players) are as shown below:

	H	D
H	$\frac{1}{2}(v-c)$	v
D	0	$v/2$

Beginning with some random mix of conspecifics, how might natural selection lead the animals to behave? It depends. If $v > c$, Hawkish behavior is the winner because any expected fitness losses are more than offset by expected fitness gains ($\frac{1}{2}(v-c) > 0$), making the risk of injury worthwhile. Suppose, however, that $v < c$, so that fighting is a losing proposition. Maynard Smith demonstrated that what might evolve is a hybrid Bourgeois type that acts consistently as neither Hawk nor Dove, but instead behaves in accord with a new rule: "if owner, play Hawk; if intruder, play Dove."⁶⁵ So long as $v < c$,

⁶² See generally Hanna Kokko et al., *From Hawks and Doves to Self-Consistent Games of Territorial Behavior*, 167 AM. NATURALIST 901, 901 (2006) ("The animal kingdom provides countless examples of the 'prior-residence effect' . . ."). For a very accessible introductory discussion, see JOHN ALCOCK, ANIMAL BEHAVIOR: AN EVOLUTIONARY APPROACH 264-73 (8th ed. 2005).

⁶³ JOHN MAYNARD SMITH, *EVOLUTION AND THE THEORY OF GAMES* (1982). Much of Maynard Smith's discussion in the book owes to earlier work by him and others dating back several decades.

⁶⁴ *Id.* at 11-12.

⁶⁵ *Id.* at 22.

animals that happen to behave according to the Bourgeois strategy (protecting what they possess and deferring to those in possession) fare better than they would by behaving any other way;⁶⁶ they “avoid more damaging encounters than the pure Hawks and win more encounters than pure Doves.”⁶⁷ Hence the strategy can proliferate until, eventually, it characterizes the behavior of the entire population. At that point, Bourgeois is an “evolutionarily stable strategy” (ESS),⁶⁸ meaning “a strategy such that, if all the members of a population adopt it, then no mutant strategy could invade the population under the influence of natural selection.”⁶⁹

The evolution of the Bourgeois strategy depends on the asymmetry of possessor and intruder, an observable characteristic that signals to a contestant the role—Hawk or Dove—likely to be played by an opponent, such that the contestant can behave in light of the information the signal provides. It is not necessary, however, that being an occupant confer any actual advantage in defending territory. All that matters is that the asymmetry between possessor and intruder “is unambiguously perceived by both contestants.”⁷⁰ Where that condition holds, the rule of “deference to possessors” can develop and persist simply as the consequence of utterly self-interested individual action.⁷¹

⁶⁶ Maynard Smith’s analysis and conclusions, given his assumptions, appear to be uncontested. For the mathematical details of his treatment, see *id.* at 11–23, 94–96; Hirshleifer, *supra* note 24, at 20–24.

⁶⁷ Chris Meredith, Tit for Tat, <http://www.abc.net.au/science/slab/uttat/story.htm> (last visited Sept. 7, 2009).

⁶⁸ MAYNARD SMITH, *supra* note 63, at 23 (citation and internal quotation marks omitted).

⁶⁹ *Id.* at 10.

⁷⁰ *Id.* at 23. In a case where possession of a territory does confer an actual advantage in defending it, or where possessors are commonly larger or stronger, the asymmetry is said to be correlated. “An uncorrelated strategy can be evolutionarily stable even when there is a correlated strategy also available.” Jeffrey Evans Stake, *The Property “Instinct”*, 359 PHIL. TRANSACTIONS: BIOLOGICAL SCI. 1763, 1764 (2004) (citing Peter Hammerstein, *The Role of Asymmetries in Animal Contests*, 29 ANIMAL BEHAV. 193 (1981)). Moreover, a strategy might be correlated early on—because possession is sometimes a defensive advantage, or because stronger individuals generally appear as first occupants—yet become uncorrelated later on, as the mere fact of possession becomes a proxy for advantages that in fact no longer hold.

Just as the Bourgeois strategy is an ESS, so is its opposite—if possessor, play Dove, if intruder, play Hawk. This ESS is regarded as “paradoxical” because evolutionary theory would seem to rule it out. Animals behaving in anti-Bourgeois fashion would end up constantly moving around, looking for territory and occupying it, only to be quickly displaced. There would be no time for breeding. Maynard Smith was aware of the problem (and of the case of a type of spider that seems to exhibit the paradoxical strategy). See MAYNARD SMITH, *supra* note 63, at 96–97. A resolution of the paradox is suggested by Kokko et al., *supra* note 62, at 909.

⁷¹ Maynard Smith’s model shows that the Bourgeois strategy can evolve, not that it invariably will. See Hirshleifer, *supra* note 24, at 23 (asserting that the development of the strategy depends on individuals “able to distinguish between owner and interloper situa-

Social scientists familiar with game theory were quick to notice the relationship between Maynard Smith's analysis and Hume's notion of conventions. A notable example is the work of the economist Robert Sugden.⁷² He altered Maynard Smith's model to fit the human context—namely by “substituting a subjective concept of utility for Darwinian fitness as the measure of success,” and by “assuming that more successful strategies [conventions, in Hume's terms] supplant less successful ones by a process of imitation and learning rather than by one of biological natural selection.”⁷³ In the biological model, behavior is genetically predetermined. In the human model, it is consciously chosen, but *individually*—by any actor given his or her utility and given the expected behavior of others—not collectively (whether by agreement among the members of a group, or by a central authority on behalf of others). Hume supposed, contrary to Hobbes and Locke, that individual choice could lead to group harmony, even in the face of self-interest. Sugden aimed to show, in rigorously logical terms, that Hume was correct, at least as to property rights. He rested his argument on the Hawk-Dove-Bourgeois game⁷⁴ and reached conclusions much like those of Maynard Smith. Repeated play would likely lead to a convention—a de facto property rule—of deference to possessors.⁷⁵

tions, and . . . able to execute the appropriate behavioral maneuvers of both Hawk and Dove”). Still, Maynard Smith's analysis “shows that respect for ownership is a possible evolutionary emergence that need not call upon any force other than private advantage. . . . On the human level, a corresponding environmental situation might be expected to lead to a ‘social ethic’ supporting a system of property rights.” *Id.* (citation omitted).

⁷² ROBERT SUGDEN, *THE ECONOMICS OF RIGHTS, CO-OPERATION AND WELFARE* (Palgrave Macmillan 2004) (1986). The second edition is virtually the same as the first, save for a new Introduction and Afterword.

⁷³ *Id.* at 62. Despite the substitution, Sugden believed that much of the biological analysis “can be carried over to the human case.” *Id.* He expanded on this point later, noting among other things that “[s]ince so many animals do have an innate sense of possession and territory, it would not be surprising if this was true for our species.” *Id.* at 107. To the same effect, see Jack Hirshleifer, *Privacy: Its Origin, Function, and Future*, 9 J. LEGAL STUD. 649, 657 (1980) (suggesting that evolution may have led to a “hard-wired” defensive attitude regarding possessions and a deferential attitude regarding the possessions of others); Stake, *supra* note 70, at 1763 (arguing that humans may share a “hard-wired” property “instinct”). Both Hirshleifer and Stake discuss the Maynard Smith model and consider its relevance to the development of property and other rights. A commentary on Hirshleifer also briefly discusses respect for possession from the standpoint of evolutionary theory. See Richard A. Epstein, *A Taste for Privacy? Evolution and the Emergence of a Naturalistic Ethic*, 9 J. LEGAL STUD. 665, 672–73 (1980).

⁷⁴ Sugden considered several other games as well (the war-of-attrition game—also considered by Maynard Smith—the division game, and games of commitment). I omit that part of his discussion because he found the other games led to results matching those of the Hawk-Dove-Bourgeois game. For the curious, the relevant pages are SUGDEN, *supra* note 72, at 65–86.

⁷⁵ Several commentators have argued that deference to possessors might have evolved because of an endowment effect, according to which an individual puts a systematically higher value on something possessed than on an opportunity to possess the very same

Sugden's contribution, the first extensive adaptation of the biological model to the human context, provided a particularly interesting discussion of possession as the crucial asymmetry. Given any number of asymmetries (the difference between a strong contestant and a weak one, an attractive contestant and an ugly one, a loud contestant and a quiet one, a greedy contestant and a generous one, a rich contestant and a needy one, and so on), why settle on possession as the decisive factor? Sugden's answer began by noting that the point of a convention is to guide behavior. To perform that function, the asymmetry underlying the convention must be prominently apparent. Hume thought possession worked well in this respect (its salience led people to converge on it), and Sugden agreed. If the idea is to find a way of assigning objects to people, there is, he thought, "a natural prominence to solutions that base the assignment on some pre-existing relation between persons and objects."⁷⁶ Possession is, by the same token, usually unambiguous, and thus provides a clear indication of the status of any claimant. This makes possession cheat proof because it cannot be feigned. No fine judgments are required, as they would be if the asymmetry had to do with such attributes as neediness, attractiveness, strength, and so on.⁷⁷ Moreover, possession implies some earlier expenditure of effort, some labor, by the possessor; Sugden believed, like Locke, that labor is naturally and normally regarded as meritorious.⁷⁸ Finally, there is the biological evidence suggesting that humans, like other animals, have some "innate sense of possession and territory."⁷⁹

Two limitations of the unintended-consequences approach have to be noted before we move on.

First, its explanatory power depends on a cost-benefit relationship likely to prevail only when resources are relatively abundant. The con-

thing. See Herbert Gintis, *The Evolution of Private Property*, 64 J. ECON. BEHAV. & ORG. 1, *passim* (2007); Stake, *supra* note 70, at 1767. The argument is plausible, but so is its opposite. Rather than generating the convention of deference to possessors, the endowment effect could just as well owe to it, in that deference to possession adds to the value of possession.

⁷⁶ SUGDEN, *supra* note 72, at 97 (discussing HUME, *supra* note 10, bk. 3, pt. 2, § 3, at 504 n.1: "As property forms a relation betwixt a person and an object, 'tis natural to found it on some preceding relation . . ."). Hume extended the convention of possession to property acquired by prescription, accession, and succession. See *id.* bk. 3, pt. 2, § 3, at 509-13.

⁷⁷ In this connection, it is interesting to recall that the majority decision in *Pierson v. Post*, discussed *supra* note 47, opted for first capture of a wild animal, as opposed to the dissent's approach of first pursuit, as the act needed to give rise to ownership. The court selected capture "for the sake of certainty," noting that the alternative of first pursuit, given its ambiguity, "would prove a fertile source of quarrels and litigation." 3 Cai. 175, 179 (N.Y. Sup. Ct. 1805).

⁷⁸ See SUGDEN, *supra* note 72, at 100-01.

⁷⁹ *Id.* at 107; see also *supra* note 73 and accompanying text.

vention of deference, recall, depends on $v < c$, calculated from each individual actor's point of view.⁸⁰ If resource values increased to the point that $v > c$ (calculated in the same fashion), the precondition for deference would no longer be met, and the de facto regime would be vulnerable to breakdown. Hawk would become the winning strategy and the new equilibrium,⁸¹ resulting in a reversion to a Hobbesian state of nature. This, at least, is the implication of high resource value in the animal setting,⁸² but surely it has some application to the human animal as well. As Hume observed, the temptation of one man to interfere with the possessions of another "is less conspicuous, where the possessions . . . are few, and of little value, as they always are in the infancy of society."⁸³ In short, scarcity threatens breakdown of the convention-based de facto property system, absent some third-party enforcement authority for which the invisible-hand argument appears not to provide.⁸⁴

A second limitation of the unintended-consequences approach is that it cannot account for anything beyond very simple property rules because the asymmetries on which it depends must be crude in order to be effective.⁸⁵ Recall, for example, the subtle distinctions that governed rules about trespass on Indian hunting territories.⁸⁶ It is unlikely that these could have developed simply by means of a convention based on possession. And this is true in spades for modern property systems like that of the common law, with multiple types of possessory estates, future interests (contingent or not), servitudes, restrictions on alienability, and so on (and on, and on). Complicated

⁸⁰ See *supra* text accompanying notes 65–66.

⁸¹ MAYNARD SMITH, *supra* note 63, at 95.

⁸² See Alan Grafen, *The Logic of Divisively Asymmetric Contests: Respect for Ownership and the Desperado Effect*, 35 ANIMAL BEHAV. 462, 463 (1987); see also MAYNARD SMITH, *supra* note 63, at 95 (stating that when $v > c$, "it is worth risking injury to gain the resource" and "ownership will be ignored").

⁸³ HUME, *supra* note 10, bk. 3, pt. 2, § 8, at 539.

⁸⁴ There is some suggestion in the literature that third-party enforcement might develop spontaneously under certain conditions, thanks to the appearance of punishers who keep defectors in line. Models leading to this result can be found in BOWLES, *supra* note 18, at 381–90, and Christoph Hauert et al., *Via Freedom to Coercion: The Emergence of Costly Punishment*, 316 SCI. 1905 (2007).

⁸⁵ See *supra* text accompanying notes 76–77. It is worth noting that while a convention of deference to possessors can account for only simple property rules, still the simple rules can amount to the rights to exclude, use, and transfer, which are usually regarded as the core elements of property. If there is a practice of deferring to possessors, that is equivalent to saying that possessors are empowered to exclude, to use what they possess, and to transfer their rights (the transferee becomes the new possessor and hence enjoys deference). All of this follows especially if possession earns deference even when actual constant physical possession is not required, on which see *infra* notes 92–93 and accompanying text.

⁸⁶ See *supra* note 6 and accompanying text.

systems depend to a considerable degree on a process of intentional design.

VII

We have considered two different ways to explain the evolution of property rights. One way attributes property to intentional design, the other to unintended consequences. Put side by side and compared, the picture is pretty clear. The great advantage of the intentional-design approach is that it can, in principle, account for the creation and enforcement of property rights from alpha to omega, for every detail of any property regime from the beginning right up to now. The great disadvantages of the approach are that it entails the difficult task of accounting for the origins and actions of the designer and implies a degree of human rationality that probably had not yet developed by the time the first primitive property rights emerged. The unintended-consequences approach avoids these difficulties,⁸⁷ but at the price of two others. It copes poorly with the historic fact of resource scarcity and cannot explain the development of complex property systems.

Notice from this little summary how the strengths and weaknesses of the two approaches match up. What the first approach does well, the second does not; and what the second approach does well, the first does not. This, to my mind, facilitates a fruitful combination of the two approaches. I conclude with a sketch constructed in that fashion, drawn in the context of a rough timeline of human evolution.

The move from primitive hominids to biologically modern humans occurred by increments over millions of years, with the first *Homo* probably branching off from its ancestors about three million years B.P.⁸⁸ A surge of particularly rapid development began about 100,000 years B.P. and, it appears, only in the course of that period did humans develop the capacity for language and abstract thinking.⁸⁹ It is more plausible, then, to suppose that property rights first emerged among early humans as a product of deference to possession, rather than as a product of design, simply because early humans probably lacked the intellectual equipment essential to the design process.

⁸⁷ Yet it has been largely ignored in the legal literature on the evolution of property rights, seldom earning more than a nod, if that. The few exceptions to that generalization have been noted in our discussion.

⁸⁸ The abbreviation B.P., commonly used in evolutionary studies, refers to "before present," where "present" is taken to be the year 1950. On the emergence of *Homo*, see, for example, EDWARD O. WILSON, *SOCIOBIOLOGY: THE NEW SYNTHESIS* 564–65 (25th anniv. ed. 2000).

⁸⁹ See, e.g., *id.* at 564–69 (briefly discussing the literature); Jonathan Haidt et al., *The New Synthesis in Moral Psychology*, 316 *SCI.* 998 (2007).

During most of the last hundred millennia, humans lived as hunter-gatherers. What anthropologists surmise about their modes of social organization rests, in part, on backwards reasoning from the behavior of various still-extant hunter-gatherer groups. Reliable generalizations about early property rights among hunter-gatherers are consistent with the notion that the rights emerged as unintended consequences; they attached to items severed (or fashioned) from the common stock—gathered food, tools, weapons, and temporary habitations. In contrast, land and its standing resource stock were regarded as communal for a very long time,⁹⁰ probably because the hunter-gatherers' large foraging territories could not be unambiguously possessed in the way that such items as tools and weapons could be, and unambiguous possession was, of course, crucial to the asymmetry needed to drive a convention of deference.⁹¹

The status of land in the hunter-gatherer scheme eventually changed from communal to individual ownership, for reasons tightly tied to the invention of agriculture about 10,000 years ago. Effective farming would have been a dicey proposition on communally owned land because of shirking on the side of production and overconsumption of the harvest—problems warded off by individual ownership of separate plots. And just as individual ownership facilitated agriculture, so agriculture facilitated individual ownership. Planting, tilling, and harvesting had the effect of marking plots of land with unambiguous signs of possession, thus providing the asymmetry crucial to deference.⁹² A consequence is that rights based on possession could come to be “permanent,” rather than “transient,” persisting even when owners were not in continuous actual possession, provided there were signs of ongoing ownership claims (recall again Demsetz's example of Indians marking their hunting territories).⁹³

⁹⁰ See, e.g., WILSON, *supra* note 88, at 564–69. Koichi Kitanishi, *Food Sharing Among the Aka Hunter-Gatherers in Northeastern Congo*, 25 AFR. STUDY MONOGRAPHS SUPPLEMENT 3, 5 (1998), states that “land and its resources were communally owned, whereas tools, weapon[s] and procured food were owned individually in hunter-gatherer societies.” *Id.* (citation omitted). He adds, however, that “ownership” of food carried with it an obligation to share by way of obligatory gifts. See *id.* at 22–24.

⁹¹ See BOWLES, *supra* note 18, at 389–90. Recall Demsetz's mention of Indians marking their hunting territories (which were in fixed locations). See *supra* text accompanying note 35. Elsewhere he notes that private rights in hunting territories would not be worthwhile in the case of grazing animals that roam over large tracts of land. Demsetz, *supra* note 1, at 353.

⁹² See BOWLES, *supra* note 18, at 388–90. This “constructive possession” effect could have reached beyond land to personal items, such as farming tools or crops stored on the farm plot.

⁹³ See *supra* text accompanying note 35. My reference to “permanent” and “transient” property echoes the words of another classic figure in the literature on the development of property rights. See 2 WILLIAM BLACKSTONE, COMMENTARIES *3–7. Blackstone used those adjectives in stating his view of how property developed over time: First there was an open commons; a commoner who took from it acquired “a kind of transient property” as to

Coincident with the emergence and spread of agriculture, "populations increased enormously in density, and the primitive hunter-gatherer bands gave way locally to the relentless growth of tribes, chiefdoms, and states."⁹⁴ As suggested earlier, what seeded developments in the number and nature of governing authorities was probably the ability of small, close-knit groups to overcome collective action problems.⁹⁵ The move from small organized groups to large, organized nation states worked through a process of aggregation by merger and conquest (of populations and territories).⁹⁶ Most likely, this confluence of developments worked a shift in the world of property rights, making their future largely a matter of social rather than natural engineering, of design rather than evolution. It is a good thing that matters developed this way. Population growth spurred demand for resources. The resulting higher resource values made new property rights worthwhile—as Demsetz would put it, the benefits outweighed the costs entailed. At about the same time, happily enough, new institutions appeared to design and enforce the rights. Enforcement was particularly important because the very factor that stimulated the development of new property rights, more valuable resources, also threatened the stability of the old regime based on deference. Property became worth fighting for ($v > c$). So design saved us from moving back to the state of nature, at least so far.

Notwithstanding, what evolved early on continues to endure. Possession, as any property lawyer knows, remains the cornerstone of most contemporary property systems—nine points of the law, the root of title, and the origin of property.⁹⁷

which the "right of possession continued for the same time only that the *act* of possession lasted." *Id.* at *3. Then, later, there developed "permanent" rights that did not depend on constant physical possession. *Id.* at *4. These permanent rights were first in personal items such as food and clothing. Eventually, though, land came to be treated in the same fashion, coincident with the rise of agriculture. *Id.* at *5–7. Finally, the government entered the picture to secure rights. *Id.* at *8.

So far as I am concerned, Blackstone's account was extraordinarily prescient, anticipating modern accounts (and not just mine) of the evolution of property rights by more than two hundred years.

⁹⁴ WILSON, *supra* note 88, at 569.

⁹⁵ See *supra* text accompanying notes 42–43.

⁹⁶ See Robert L. Carneiro, *A Theory of the Origin of the State*, 169 *Sci.* 733 (1970) (elaborating on circumscription theory as an explanation for the origin of a state).

⁹⁷ See, e.g., *Kingston-upon-Hull v. Horner*, 98 Eng. Rep. 807, 815 (1774) (Lord Mansfield observing: "Possession is very strong; rather more than nine points of the law."); Richard A. Epstein, *Possession as the Root of Title*, 13 *GA. L. REV.* 1221 (1979); Carol M. Rose, *Possession as the Origin of Property*, 52 *U. CHI. L. REV.* 73 (1985).

